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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/776,632	02/12/2004	Hiroshi Fujimoto	Q79762	1773

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EXAMINER
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WILLIS, RANDAL L

ART UNIT	PAPER NUMBER
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2629

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/16/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	10/776,632	FUJIMOTO ET AL.	
	Examiner	Art Unit	
	Randal L. Willis	2629	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 February 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 February 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☒ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>5/12/2004</u> | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. This office action is in response to application No. 10/776632, filed Feb. 12, 2004. Claims 1-17 are currently pending and have been examined.

#### ***Priority***

2. Acknowledgment is made of applicant's claim for foreign priority based on application filed in Japan on Feb. 13, 2003 and Sep. 19, 2003. It is noted, however, that applicant has not filed a certified copy of the foreign applications as required by 35 U.S.C. 119(b).

#### ***Information Disclosure Statement***

3. The information disclosure statement (IDS) submitted on 5/12/2004 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement has been considered by the examiner.

#### ***Drawings***

4. Figures 2 and 3 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page

header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Takahashi WO 02/080626 of which US PgPub 2006/0158109 is being used as an English translation.

Apropos claim 1, Takahashi teaches:

An AC operating electroluminescence device (Title), comprising:

a light-emitting layer (234, Fig. 11) containing phosphor particles ([0194] lines 6-8); and

an insulating layer (234, Fig. 11 [0194] lines 5-6) containing an inorganic dielectric substance,

wherein said electroluminescence device is capable of causing electroluminescence (electroluminescence devices are inherently capable of causing electroluminescence),

wherein a total thickness of the light-emitting layer and the insulating layer is less than 15  $\mu\text{m}$  (insulating layer ranges from .3 $\mu\text{m}$  to 50 $\mu\text{m}$  [0194] lines 5-6, light emitting layer ranges from 2-50 $\mu\text{m}$  [0186] line 6 thus the lower ranges of both layers would be 2.3  $\mu\text{m}$ , well below 15  $\mu\text{m}$ ), and

wherein the electroluminescence device starts light emission when an average field intensity applied between electrodes in said electroluminescence device is 0.05 MV/cm or more (stated voltages ranges from 10's to 100s of volts [0180] lines 1-2, calculating 20Volts as the low range, thus the starting range and dividing by 4  $\mu\text{m}$ , which is within the stated range of values listed above, the voltage becomes .05 MV/cm).

Apropos claim 2, Takahashi teaches:

The AC operating electroluminescence device according to claim 1, wherein a total thickness of the light-emitting layer containing the phosphor particles and the insulating layer is 3 to 10 times as large as an average particle diameter of the phosphor particles (4 $\mu\text{m}$  total thickness, chosen from the

range given is within the 3 to 10 times range of thickness given the state particle size of 1.4 $\mu$ m [0259] lines 1-4).

Apropos claim 3, Takahashi teaches:

The AC operating electroluminescence device according to claim 1, wherein an average particle diameter of the phosphor particles is 0.1  $\mu$ m to 5  $\mu$ m (1.4 $\mu$ m [0259] lines 1-4 see also [0049]).

Apropos claim 4, Takahashi teaches:

The AC operating electroluminescence device according to claim 2, wherein an average particle diameter of the phosphor particles is 0.1  $\mu$ m to 5  $\mu$ m (1.4 $\mu$ m [0259] lines 1-4 see also [0049]).

Apropos claim 5, Takahashi teaches:

The AC operating electroluminescence device according to claim 1, wherein a change in current consumption increases along with an increase in luminance occurs at a field intensity applied between the electrodes, which field intensity is equal to or higher than the average field intensity at which the light emission starts (Inherent property in AC electroluminescent devices, Takahashi's device is an AC electroluminescent device, see AC source shown in Fig. 11).

Apropos claim 6, Takahashi teaches:

The AC operating electroluminescence device according to claim 2, wherein a change in current consumption increases along with an increase in luminance occurs at a field intensity applied between the electrodes, which field intensity is equal to or higher than the average field intensity at which the light emission starts (Inherent property in AC electroluminescent devices, Takahashi's device is an AC electroluminescent device, see AC source shown in Fig. 11).

Apropos claim 7, Takahashi teaches:

The AC operating electroluminescence device according to claim 3, wherein a change in current consumption increases along with an increase in luminance occurs at a field intensity applied between the electrodes, which field intensity is equal to or higher than the average field intensity at which the light emission starts (Inherent property in AC electroluminescent devices, Takahashi's device is an AC electroluminescent device, see AC source shown in Fig. 11).

Apropos claim 8, Takahashi teaches:

The AC operating electroluminescence device according to claim 4, wherein a change in current consumption increases along with an increase in luminance occurs at a field intensity applied between the electrodes, which field intensity is equal to or higher than the average field intensity at which the light emission starts (Inherent property in AC electroluminescent devices, Takahashi's device is an AC electroluminescent device, see AC source shown in Fig. 11).

Apropos claim 9, Takahashi teaches:

The AC operating electroluminescence device according to claim 1, wherein the insulating layer containing the inorganic dielectric substance is provided so as not to cover an entire surface of the phosphor particles but to come into contact with a part of the surface of the phosphor particles in an electric field direction (dielectric insulating layer 234 shown in Fig. 11 contacts phosphor particles only when they would touch against the edge which would be in direction of the electric field produced between electrodes 232b and 232a).

Apropos claim 10, Takahashi teaches:

The AC operating electroluminescence device according to claim 2, wherein the insulating layer containing the inorganic dielectric substance is provided



so as not to cover an entire surface of the phosphor particles but to come into contact with a part of the surface of the phosphor particles in an electric field direction (dielectric insulating layer 234 shown in Fig. 11 contacts phosphor particles only when they would touch against the edge which would be in direction of the electric field produced between electrodes 232b and 232a).

Apropos claim 11, Takahashi teaches:

The AC operating electroluminescence device according to claim 3, wherein the insulating layer containing the inorganic dielectric substance is provided so as not to cover an entire surface of the phosphor particles but to come into contact with a part of the surface of the phosphor particles in an electric field direction (dielectric insulating layer 234 shown in Fig. 11 contacts phosphor particles only when they would touch against the edge which would be in direction of the electric field produced between electrodes 232b and 232a).

Apropos claim 12, Takahashi teaches:

The AC operating electroluminescence device according to claim 4, wherein the insulating layer containing the inorganic dielectric substance is provided so as not to cover an entire surface of the phosphor particles but to come

into contact with a part of the surface of the phosphor particles in an electric field direction (dielectric insulating layer 234 shown in Fig. 11 contacts phosphor particles only when they would touch against the edge which would be in direction of the electric field produced between electrodes 232b and 232a).

Apropos claim 13, Takahashi teaches:

The AC operating electroluminescence device according to claim 5, wherein the insulating layer containing the inorganic dielectric substance is provided so as not to cover an entire surface of the phosphor particles but to come into contact with a part of the surface of the phosphor particles in an electric field direction (dielectric insulating layer 234 shown in Fig. 11 contacts phosphor particles only when they would touch against the edge which would be in direction of the electric field produced between electrodes 232b and 232a).

### ***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject

Art Unit: 2629

matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. Claims 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takahashi WO 02/080626 of which US PgPub 2006/0158109 is being used as an English translation in view of Taniguchi (US 5,275,967).

Apropos claim 14-17, Takahashi fails to explicitly teach the light-emitting layer having a surface smoothness of 1/8 or less of the average thickness of the light-emitting layer in terms of a center line average roughness.

In the same field of electric field effect light emitting devices, Taniguchi teaches a light emitting layer with a smooth surface (Col 6 lines 20-25), this smooth surface being in the order of 500 Å.

Therefore it would have been obvious for one of ordinary skill in the art at the time of the invention to make the light-emitting layer of Takahashi smooth as taught by Taniguchi, which would put the smoothness less than 1/8 smoothness of Takahashi's light emitting layer, in order to prevent generation of local high electric fields (Taniguchi; Col 6 lines 23-25) which would lead to better performance (Taniguchi; Col 7 lines 5-6).

### ***Conclusion***

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- a. Wu US 5,702,565 for teaching smooth phosphor layers.
- b. Li (US 2005/0249971) for teaching an AC EL device in the range of Claim 1 and luminance to voltage curves.
- c. Wu US 6,771,019) for teaching an AC EL device in the ranges of Claim 1

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Randal L. Willis whose telephone number is (571) 270-1461. The examiner can normally be reached on Monday to Friday from 7:30am to 5:00pm (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amr Awad can be reached on (571) 272-7764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

RLW

AMR A. AWAD  
SUPERVISORY PATENT EXAMINER

A handwritten signature in black ink, appearing to read "Amr A. Awad", with a large, sweeping flourish at the end.